PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

Commissioner **US Department of Commerce United States Patent and Trademark** Office, PCT 2011 South Clark Place Room CP2/5C24 Arlington, VA 22202 **ETATS-UNIS D'AMERIQUE**

in its capacity as elected Office

Date of mailing (day/month/year) 17 July 2001 (17.07.01)

International application No. PCT/US00/27210

Applicant

International filing date (day/month/year) 02 October 2000 (02.10.00)

HINTZ, William, E. et al

Applicant's	OF	agent's	file	reference
		-		

2847-56232

Priority date (day/month/year)

01 October 1999 (01.10.99)

1.	The designated	Office is hereby	notified of its	s election made:
----	----------------	------------------	-----------------	------------------

X in the demand filed with the International Preliminary Examining Authority on: 27 April 2001 (27.04.01)

in a notice effecting later election filed with the International Bureau on:

2. The election

was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland

Authorized officer

Odile ALIU

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38



INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PAULA A. DE GRANDIS KLARQUIST, SPARKMAN, CAMPBELL, LEIGH & WHINSTON, LLP ONE WORLD TRADE CENTER, SUITE 1600 121 SW SALMON STREET PORTLAND, OR 97204

SLR

PCT

WRITTEN OPINION

(PCT Rule 66)

		Date of Mailing (day/month/year)	17 AUG 2001
Applicant's or agent's file reference 2847-56232		1	within TWO months rom the above date of mailing
International application No.	International filing dat	- (dav/month/year)	Priority date (day/month/year)
PCT/US00/27210	02 OCTOBER 2"		01 OCTOBER 1999
International Patent Classification (IPC IPC(7): C12N 9/00, 9/24, 15/09, 1	c) or both national classics, C07K, 16/00 a	d IPC 35/69.2, 183	3, 200; 530/389.1
Applicant UNIVERSITY OF VICTORIA INN	OVATION AND DEVEL	LOPMENT CORPOR	AATION

1.	This written o	pinion is the first (first, etc.) drawn by this International	Preliminary Examining Authority.	
2.	This opinion of	contains indications relating to the following items:	DOCKETED FOR: 10/17/01	
	I X	Basis of the opinion	ov sov man in manuscrim an analysis frameworks and an analysis	
	II 🔲	Priority	CARD CARD	
	III	Non-establishment of opinion with regard to novelty, inventive step or i	ndustrial applicability	
	IV	Lack of unity of invention	BKPR	
	v x	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventocitations and explanations supporting such statement	tive step of ind ustrial a pplicability;	
	VI 🔲	Certain documents cited		
	VII 🔲	Certain defects in the international application		
	VIII	Certain observations on the international application		
3.	The applicant	is hereby invited to reply to this opinion.		
	When?	See the time limit indicated above. The applicant may, before the expir Authority to grant an extension., see Rule 66.2(d).	ation of that time limit, request this	
	How?	By submitting a written reply, accompanied, where appropriate, by am- For the form and the language of the amendments, see Rules 66.8 and		
	Also	For an additional opportunity to submit amendments, see Rule 66.4. For the examiner's obligation to consider amendments and/or argument for an informal communication with the examiner, see Rule 66.6.	ts, see Rule 66.4 bis.	
	If no reply	is filed, the international preliminary examination report will be establish	ed on the basis of this opinion.	
4.	4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 01 FEBRUARY 2002			

Name	and	mailing	address	of	the	IPEA.	/US
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Commissioner of Patents and Trademarks

Box PCT Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

TERRY J. DEY

MANJUNATH PARALEGAL SPECIALIST

Telephone No.

(703) 308-0196





PCT/US00/27210

I. Basis of the opinion	<u> </u>
With regard to the elements of the international application	on:*
X the international application as originally file	
at a december of	
	, as originally filed
pages NONE	, filed with the demand
pages NONE	, filed with the letter of
x the claims:	, as originally filed
pages	, as amended (together with any statement) under Article 19
pages NONE	, filed with the demand
	rith the letter of
X the drawings:	' ' 11 C1- J
pages 1-22	, as originally filed
	, filed with the letter of
pages NONE	, filed with the fetter of
x the sequence listing part of the description:	
pages 1-13	, as originally filed
pages NONE	, filed with the demand
pages NONE	, filed with the letter of
the language of publication of the internation the language of the translation furnished for the or 55.3).	onal application (under Rule 48.3(b)). purposes of international preliminary examination (under Rules 55.2 and
,	equence disclosed in the international application, the written opinion was
X contained in the international application in	printed form.
X filed together with the international applica	
furnished subsequently to this Authority in	
furnished subsequently to this Authority in	
	written sequence listing does not go beyond the disclosure in the
The statement that the information recorded in obeen furnished.	computer readable form is identical to the writen sequence listing has
4. X The amendments have resulted in the cancer	ellation of:
X the description, pages NONE	
x the claims, Nos. NONE	1
X the drawings, sheets/Fig NONE	With the second
	amondments had not been made since they have been considered to go
5. This opinion has been drawn as if (some of) the beyond the disclosure as filed, as indicated in the	amendments had not been made, since they have been considered to go the Supplemental Box (Rule 70.2(c)).
* Replacement sheets which have been furnished to the red in this opinion as "originally filed".	ceiving Office in response to an invitation under Article 14 are referred to



2
In bnal application No.
PCT/US00/27210

v.	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicable	ility;
	citations and explanations supporting such statement	

1.	statement			
	Novelty (N)		2, 7 1, 3-6, 8-14	YES NO
	Inventive Step (IS)	Claims Claims	NONE 1-14	YES NO
	Industrial Applicability (IA)	Claims Claims	NONE NONE	YES NO

2. citations and explanations

Claims 1, 3-6, 8-14 lack novelty under PCT Article 33(2) as being anticipated by Inoue et al.

Claims 1, 3-6, 8-14 are drawn to a purified protein having mannosidase activity comprising an amino acid sequence selected from the group consisting of a)SEQ ID NOs:3, 6, and 18, b)a conservative variant, or c)amino acid sequences having at least 60% sequence identity to the sequences specified in a) (claim 1), an isolated nucleic acid encoding the same, vector, host cell, a method for altering glycosylation pattern of a macromolecule (claims 3-6, 8-10), an isolated nucleic acid comprising a sequence selected from the group consisting of at least 15 nucleotides of SEQ ID NO:1 (claim 11(a)), a method for altering glycosylation pattern (claim 12), a method for isolating nucleic acid sequence encoding a mannosidase and a mannosidase identified by the above method (claims 13-14). Inoue et al. disclose a the isolation and identification of a mannosidase that is more than 60% identical to SEQ ID NO:6 and also disclose a nucleic acid encoding a mannosidase which is at least 15 nucleotides identical to SEQ ID NO:1, and the above described methods. Therefore Inoue et al. anticipate claims 1, 3-6, 8-14 of the instant application as written.

Claim 11 lacks novelty under PCT Article 33(2) as being anticipated by Kupfer et al.

Claim 11 is drawn to an isolated nucleic acid molecule comprising a sequence selected from a group consisting of at least 15, 20, 30 nucleotides of SEQ ID NO: 1, 4 or 17. Kupfer et al. disclose a nucleic acid molecule comprising 15, 20 or 30 nucleotides of SEQ ID NO:17. Therefore Kupfer et al. anticipate claim 11 of the instant application as written.

Claims 1-14 lack an inventive step under PCT Article 33(3) as being obvious over Inoue et al. in view of Turco et al. Claims 1-14 are drawn to a purified protein having mannosidase activity comprising an amino acid sequence selected from the group consisting of a)SEQ ID NOs:3, 6, and 18, b)a conservative (Continued on Supplemental Sheet.)





International application No.

PCT/US00/27210

Supp	lemental	Box
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(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.

V. 2. REASONED STATEMENTS - CITATIONS AND EXPLANATIONS (Continued):

variant, or c)amino acid sequences having at least 60% sequence identity to the sequences specified in a) (claim 1), a binding agent (claim 2), an isolated nucleic acid encoding the same, vector, host cell, a method for altering glycosylation pattern of a macromolecule (claims 3-6, 8-10), a transgenic fungus (claim 7), an isolated nucleic acid comprising a sequence selected from the group consisting of at least 15 nucleotides of SEQ ID NO:1 (claim 11(a)), a method for altering glycosylation pattern (claim 12), a method for isolating nucleic acid sequence encoding a mannosidase and a mannosidase identified by the above method (claims 13-14). Inoue et al. disclose a mannosidase that more than 60% identical to SEQ ID NO:6 and also a nucleic acid sequence encoding such a mannosidase and wherein at least 15 nucleotides are identical to SEQ ID NO:1. However, the reference does not teach the production of a transgenic fungus or the glycosylation methods. Turco et al. teach the different methods of glycosylation using a mnnosidase enzyme. It would have been obvious to one of ordinary skill in the art to combine the above two references with the high level of knowledge in the art of molecular biology to make a transgenic fungus comprising the above alpha-mannosidase and also to develop an assay to detect other mannosidases using the above polynucleotide sequences. One of ordinary skill in the art would have been motivated to do so as Inoue et al. provide a new alpha-mannosidase isolated from a industrially important fungus. One of skill in the art would have had a reasonable expectation of success since Inoue et al provide methods for all the above and also provide a nucleic acid sequence and an amino acid sequence of a alpha-mannosidase. therefore, the above invention would have been prima facie obvious to one of ordinary skill in the art.

Claims 2 and 7 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a binding agent or a transgenic fungus for alpha-mannosidase.

Database GenBank Accession No. AA787675, (KUPFER et al.) An Aspergillus nidulans EST database, 31 July 1998. Database Sptrembl_16 Accession No. Q12563, (INOUE et al.) Alpha mannosidase, 01 November 1996.



From the INTERNATIONAL SEARCHING AUTHORITY

To: PAULA A. DE GRANDIS
KLAROUIST, SPARKMAN, CAMPBELL, LEIGH &

WHINSTON, LLP				
ONE WORLD TRADE CENTER, SUITE 1600 121 SW SALMON STREET	NOTIFICATION OF TRANSMITTAL OF			
PORTLAND, OR 97204	THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION			
	OK THE BEODMATTION			
	(PCT Rule 44.1)			
	Date of Mailing (day/month/year) 2 8 FEB 2001			
Applicant's or agent's file reference	FOR FURTHER ACTION See paragraphs 1 and 4 below			
2847-56232				
International application No.	International filing date (day/month/year)			
PCT/US00/27210	02 OCTOBER 2000			
Applicant UNIVERSITY OF VICTORIA INNOVATION AND DEVEL	OPMENT CORPORATION			
1. X The applicant is hereby notified that the internationa	l search report has been established and is transmitted herewith.			
Filing of amendments and statement under Artic The applicant is entitled if he so wishes, to amend	le 19: the claims of the international application (see Rule 46):			
When? The time limit for filing such amendm	nents is normally 2 months from the date of transmittal of the r more details, see the notes on the accompanying sheet.			
Where? Directly to the International Bureau of V				
34, chemin des Colombe 1211 Geneva 20, Switze Pacsimile No.: (41-22)	rland ettes			
For more detailed instructions, see the notes of	n the accompanying sheet.			
2. The applicant is hereby notified that no internationa Article 17(2)(a) to that effect is transmitted herewith	l search report will be established and that the declaration under h.			
3. With regard to the protest against payment of (an	a) additional fee(s) under Rule 40.2, the applicant is notified that:			
the protest together with the decision thereon applicant's request to forward the texts of bo	has been transmitted to the International Bureau together with the the protest and the decision thereon to the designated Offices.			
· ·	; the applicant will be notified as soon as a decision is made.			
4. Further action(s): The applicant is reminded of the fo	bllowing:			
Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.				
Within 19 months from the priority date, a demand for i wishes to postpone the entry into the national phase up	nternational preliminary examination must be filed if the applicant ntil 30 months from the priority date (in some Offices even later).			
Within 26 months from the priority date, the applicant i	nust perform the prescribed acts for entry into the national phase sted in the demand or in a later election within 19 months from the			
	Authorized officer			
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks	MANJUNATH RAO TERRY J. DEY			
Dov DCT	BARAL BOTOLLINT			

Washington, D.C. 20231

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PAPALEGAL SPECIALIST

(703) 30**TECHNOLOGY CENTER 1600** Telephone No.



PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2847-56232	FOR FURTHER see ACTION (For	Notification of Transmittal of International Search Report m PCT/ISA/220) as well as, where applicable, item 5 below.
International application No.	International filing date (day	n/month/year) (Earliest) Priority Date (day/month/year)
PCT/US00/27210	02 OCTOBER 2000	01 OCTOBER 1999
Applicant UNIVERSITY OF VICTORIA INNOV	ATION AND DEVELOPME	NT CORPORATION
This international search report has been according to Article 18. A copy is being	n prepared by this International g transmitted to the Internation	Searching Authority and is transmitted to the applicant al Bureau.
This international search report consists X It is also accompanied by a companied by a companie	of a total of sheets. opy of each prior art document	cited in this report.
1. Basis of the report		
a. With regard to the language, th	e international search was carried unless otherwise indicated under	out on the basis of the international application in the
the international search was Authority (Rule 23.1(b)).	carried out on the basis of a tr	anslation of the international application furnished to this
 b. With regard to any nucleotide a was carried out on the basis of 	and/or amino acid sequence dis the sequence listing;	closed in the international application, the international search
contained in the international	-	
filed together with the intern	national application in computer	readable form.
furnished subsequently to thi	s Authority in written form.	
	s Authority in computer readal	
the statement that the subsequence international application as f	uently furnished written sequence iled has been furnished.	æ listing does not go beyond the disclosure in the
		e form is identical to the written sequence listing has b een
2. Certain claims were found	unsearchable (See Box I).	
3. X Unity of invention is lacking (See Box II).		
4. With regard to the title,		
X the text is approved as subm	itted by the applicant.	
the text has been established	by this Authority to read as fo	llows:
5. With regard to the abstract,		
X the text is approved as submi	itted by the applicant.	
the text has been established,	according to Rule 38.2(b), by within one month from the date	this Authority as it appears in of mailing of this international
6. The figure of the drawings to be pu	blished with the abstract is Fig	ure No
as suggested by the applicant		X None of the figures.
because the applicant failed to	o suggest a figure.	A None of the figures.
because this figure better cha	racterizes the invention.	





Во	x I	Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)
Thi	is i nt e	ernational report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1.		Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2.		Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3.		Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Во	x II	Observations where unity of invention is lacking (Continuation of item 2 of first sheet)
Th	is In	ternational Searching Authority found multiple inventions in this international application, as follows:
	1	Please See Extra Sheet.
1.	X	As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.		As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.		As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4.		No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
R	ema:	The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.

						
A. CLASSIFICATION OF SUBJECT MATTER IPC(7) :C12N 9/00, 9/24, 15/09, 1/20; C07K 16/00						
US CL: 435/69.2, 183, 200; 530/389.1 According to International Patent Classification (IPC) or to both national classification and IPC						
B. FIELDS SEARCHED Minimum documentation searched (classific	action system 6-11 1	hu alanification	·			
Minimum documentation searched (classific		by classification symbols)				
U.S. : 435/69.2, 183, 200; 530/389.1			,			
Documentation searched other than minimum	documentation to the ex	stent that such documents are included i	n the fields searched			
	2 ule c/	more than such documents are included i	n die Heids seateiled			
Electronic data base consulted during the in	ternational search (nam	e of data base and, where practicable.	search terms used)			
BIOSIS, CAPLUS, EMBASE, MEDLIN	·	•	,			
	_ , , _ 001 .	= - · · 				
C. DOCUMENTS CONSIDERED TO	BE RELEVANT					
Category* Citation of document, with	indication, where appr	ropriate, of the relevant passages	Relevant to claim No.			
1		mouse golgi mannosidase	1, 3-14			
		conserved from yeasts to 4, Vol. 269, No. 13, pages	1, 3-14			
9864-9871, see especia			1, 3-1-			
700+ 7071, see especie	my pages 3070-30	J/ 1,				
X LAL ET AL. Isolation	and expression o	f murine and rabbit cDNAs	1, 3-14			
	•	ved in the processing of	-,			
		siol. Chem. 01 April 1994,	1, 3-14			
Vol. 269, No. 13, pag	,					
, , , , , , , , , , , , , , , , , , , ,						
Y TURCO ET AL. A	1, 3-14					
		d baby hamster kidney cells.	ŕ			
f		', No. 15, pages 8674-8679,				
see entire article.		~ -				
	·					
X Further documents are listed in the c	ontinuation of Box C.	See patent family annex.				
* Special categories of cited documents:	"7	later document published after the inte date and not in conflict with the appl				
"A" document defining the general state of the at to be of particular relevance	t which is not considered	the principle or theory underlying the				
"E" earlier document published on or after the	international filing date	K* document of particular relevance; the considered novel or cannot be considered.				
"L" document which may throw doubts on pric		when the document is taken alone	100 to the other art westings greb			
cited to establish the publication date of a special reason (as specified)	another citation or other	Y" document of particular relevance; the considered to involve an inventive				
"O" document referring to an oral disclosure, means	use, exhibition or other	combined with one or more other such being obvious to a person skilled in t	h documents, such combination			
"P" document published prior to the international the priority date claimed	l filing date but later than • 8	&" document member of the same patent	t family			
Date of the actual completion of the interna	tional search D	Date of mailing of the international sea	arch report			
15 JANUARY 2001		28 FEB 2001	n d			
Name and mailing address of the ISA/US	A	authorized officer	Pm			
Commissioner of Patents and Trademarks Box PCT			ERRY J. DEY			
Washington, D.C. 20231		TECHNO	EGAL SPECIALIST V LOGY CENTER 1600			
Facsimile No. (703) 305-3230	T	elephone No. (703) 308-0196	LOGI CENTEN 1000			

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
·•	US 5,837,836 A (FRIDERICI ET AL.) 17 November 1998 (17/11/98) see entire document.	2 2
	US 5,578,484 A (HOROSZEWICZ) 26 November 1996 (26/11/96) see entire document.	2 2
•	EADES ET AL. Identification and analysis of a class 2 alphamannosidase from Aspergillus nidulans. Glycobiology. 1998, Vol. 8, pages 17-33, see entire document.	1-14 1-14
-	INOUE ET AL. Molecular cloning and nucleotide sequence of the 1,2-alpha-D-mannosidase gene, msds, from Aspergillus saitoi and expression of the gene in yeast cells. Biochimica et Biophysica Acta. 1995, Vol. 1253, pages 141-145, see entire document.	1-14 1-14
٠		

l application No. 500/27210

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single

inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claims 1, 3-7, 11, 13-14, drawn to a purified mannosidase, polynucleotides and method of making.

Group II, claim 2, drawn to a binding agent that binds the purified protein.

Group III, claims 8-10 and 12, drawn to a method of altering glycosylation pattern of a macromolecule.

The inventions listed as Groups I-III do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Mannosidases, their polynucleotides, binding agents and method of altering the glycosylation pattern of macromolecules are well known in the prior art. Thus, the above invention, when considered as a whole does not contribute over the prior art (see Turco et al. J. Biol. Chem., 1982, Vol. 257(15):8674-8679).

(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 12 April 2001 (12.04.2001)

PCT

(10) International Publication Number WO 01/25406 A1

(51) International Patent Classification⁷: 9/24, 15/09, 1/20, C07K 16/00

C12N 9/00,

(21) International Application Number: PCT/US00/27210

(22) International Filing Date: 2 October 2000 (02.10.2000)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/157,341

1 October 1999 (01.10.1999) US

- (71) Applicant (for all designated States except US): UNI-VERSITY OF VICTORIA INNOVATION & DEVEL-OPMENT CORPORATION [CA/CA]: Box 3075 R-Hut, McKenzie Avenue, Victoria, British Columbia V8W 3W2 (CA).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): HINTZ, William, E. [CA/CA]; 5601 Matterhorn Court, Victoria, British Columbia V9E 2G1 (CA). EADES, Caleb, Joshua [US/CA]; 852 Leslie Drive, Victoria, British Columbia V8X 2Y4 (CA).
- (74) Agent: DE GRANDIS, Paula, A.; Klarquist, Sparkman, Campbell, Leigh & Whinston, LLP, Suite 1600, One World Trade Center, 121 S.W. Salmon Street, Portland, OR 97204 (US).

- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

- With international search report.
- Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.

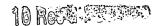
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

01/25406 A1

(54) Title: MANNOSIDASES AND METHODS FOR USING SAME

(57) Abstract: Mannosidase enzymes and use of such enzymes to alter the glycosylation patterns of macromolecules are disclosed. Also disclosed are the nucleic acid sequences encoding the mannosidase enzymes.

PCT/US00/27210



型5 MAR 2002

SEQUENCE LISTING

<110> Hintz, William et al.

<120> Mannosidases and Methods for using the Same

<130> 56232

<140>

<141>

<150> 60/157,341

<151> 1999-10-01

<160> 19

<170> PatentIn Ver. 2.0

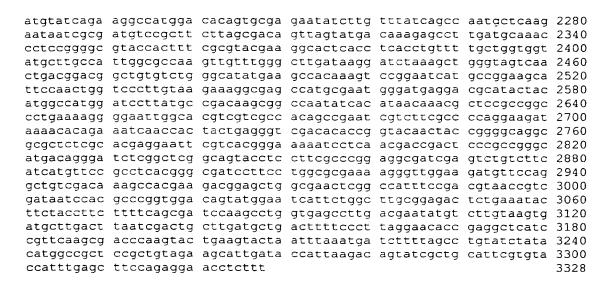
<210> 1

<211> 3328

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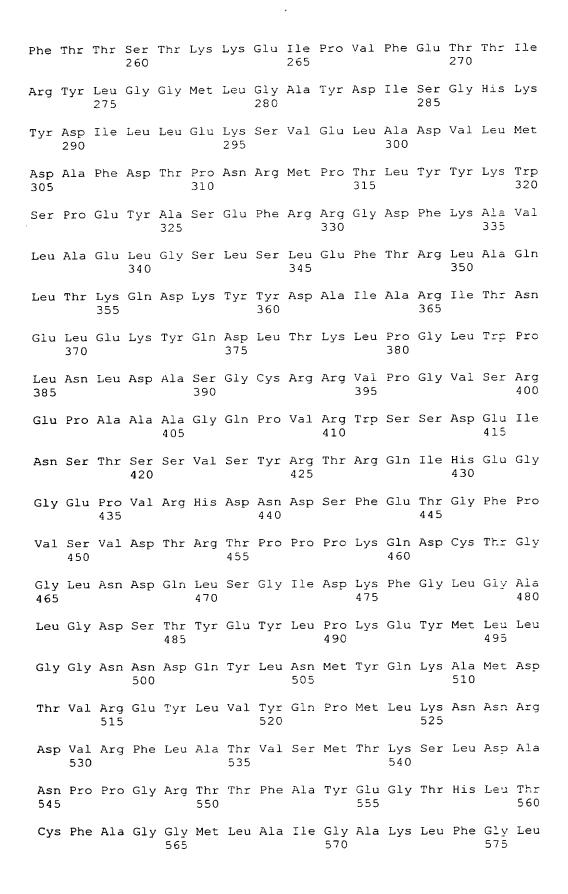
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325 330 335

Ser Ala Tyr Glu Tyr Leu Gly Lys Thr Tyr Arg Leu Leu Gly Gly Val 340 345 350

Gly Lys Gly Pro Gln Tyr Glu Arg Leu Ala Arg Asn Ala Leu Asp Ala 355 360 365

Gly Ile Arg His Leu Leu Phe Arg Pro Met Thr Pro Asp His Ala Asp 370 \cdot 375 380

Ile Leu Leu Pro Gly Val Ala His Ala Thr Ser Ser Ser Val Gly Leu 385 390 395 400

Glu Pro Arg Thr Glu His Leu Ala Cys Phe Val Gly Gly Met Tyr Ala 405 410 415

Leu Ala Gly Lys Leu Phe Ser Asn Gln Thr Tyr Leu Asp Thr Gly Arg 420 425 430

Lys Leu Thr Asp Gly Cys Ile Trp Tyr Tyr Asp Asn Ser Pro Leu Gly 435 440 445

Ile Met Pro Glu Met Phe Thr Val Pro Ala Cys Pro Ser Val Ala Glu 450 455 460

Cys Pro Trp Asp Glu Thr Arg Gly Gly Ile Tyr Thr Tyr Val Arg Asp 465 470 475 480

Gly His Tyr Phe Leu Arg Pro Glu Ala Met Glu Ser Ile Phe Tyr Met 485 490 495

Trp Arg Ile Thr Gly Asp Glu Lys Tyr Arg Glu Ala Ala Trp Arg Met 500 505 510

Phe Thr Ala Ile Glu Ala Val Thr Lys Thr Glu Phe Gly Asn Ala Ala 515 520 525

Val Arg Asp Val Met Val Glu Glu Gly Asn Val Lys Arg Glu Asp Ser 530 535 540

Met Glu Ser Phe Trp Met Ala Glu Thr Leu Lys Tyr Leu Tyr Leu Ile 545 550 555 560

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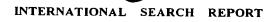
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INTERNATIONAL SEARCH REPORT



International application No. PCT/US00/27210

A. CLASSIFICATION OF SUBJECT MATTER					
	:C12N 9/00, 9/24, 15/09, 1/20; C07K 16/00				
	:435/69.2, 183, 200; 530/389.1 to International Patent Classification (IPC) or to both	national classification and IPC			
	DS SEARCHED	interior classification and if c			
	ocumentation searched (classification system follower	d by classification symbols			
	435/69.2, 183, 200; 530/389.1	T by classification symbols)			
0.3	433/07.2, 163, 200, 330/369.1				
Documentat	ion searched other than minimum documentation to the	extent that such documents are included i	n the fields searched		
Electronic d	data base consulted during the international search (na	me of data base and, where practicable,	search terms used)		
BIOSIS,	CAPLUS, EMBASE, MEDLINE, SCISEARCH, US	PTO WEST.			
C. DOC	CUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where ap	propriate, of the relevant passages	Relevant to claim No.		
X	HERSCOVIC ET AL. Isolation of	a mouse golgi mannosidase	1, 3-14		
	cDNA, a member of a gene family				
Y	mammals. J. Biol. Chem. 01 April 19		1, 3-14		
	9864-9871, see especially pages 9870-	9871.			
37	TAX DO AT THE				
X	LAL ET AL. Isolation and expression		1, 3-14		
<u></u> Y	encoding an alpha-mannosidase invo		1 2 14		
1	asparagine-linked oligosaccharides. J.		1, 3-14		
	Vol. 269, No. 13, pages 9872-9881, see entire article.				
Y	Y TURCO ET AL. Altered G-protein glycosylation in vesicular 1, 3-14				
_	stomatitis virus-infected glucose-deprived baby hamster kidney cells.				
	J. Biol. Chem. 10 August 1982, Vol. 257, No. 15, pages 8674-8679,				
	see entire article.				
X Purt	her documents are listed in the continuation of Box C	. See patent family annex.			
l	occial categories of cited documents:	"T" later document published after the inte date and not in conflict with the appl			
	becoment defining the general state of the art which is not considered be of particular relevance	the principle or theory underlying the			
·E· ca	rlier document published on or after the international filing date	"X" document of particular relevance; the considered novel or cannot be consider			
	becoment which may throw doubts on priority claim(s) or which is ted to establish the publication date of another citation or other	when the document is taken alone	·		
sp.	ecial reason (as specified)	"Y" document of particular relevance; the considered to involve an inventive	step when the document is		
	ecument referring to an oral disclosure, use, exhibition or other eans	combined with one or more other such being obvious to a person skilled in t			
	ocument published prior to the international filing date but later than e priority date claimed	*&* document member of the same patent	family		
Date of the	actual completion of the international search	Date of mailing of the international sea	rch report		
15 JANU	ARY 2001	2 8 FEB 2001	n		
	mailing address of the ISA/US oner of Patents and Trademarks	Authorized officer	ERRY J. DEY		
Box PCT	on, D.C. 20231		EGAL SPECIALIST		
Facsimile 1		Telephone No. (703) 308 (FCHNOLOGY CENTER 1600			
		· ` ` ` ` `	l.		



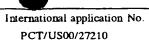


International application No. PCT/US00/27210

C (Continua	tion). DOCUMENTS CONSIDERED TO BE RELEVANT	
Category*	Citation of document, with indication, where appropriate, of the relevant passa	ges Relevant to claim No
ζ ′	US 5,837,836 A (FRIDERICI ET AL.) 17 November 1998 (17/11/98) see entire document.	2 2
. -	US 5,578,484 A (HOROSZEWICZ) 26 November 1996 (26/1 see entire document.	1/96) 2 2
-	EADES ET AL. Identification and analysis of a class 2 alphamannosidase from Aspergillus nidulans. Glycobiology. 1998, V 8, pages 17-33, see entire document.	Vol. 1-14 1-14
-	INOUE ET AL. Molecular cloning and nucleotide sequence of 1,2-alpha-D-mannosidase gene, msds, from Aspergillus saitoi a expression of the gene in yeast cells. Biochimica et Biophysica Acta. 1995, Vol. 1253, pages 141-145, see entire document.	ind
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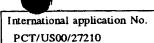


INTERNATIONAL SEARCH REPORT



Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)
This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
2. Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).
Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)
This International Searching Authority found multiple inventions in this international application, as follows:
Please See Extra Sheet.
1. X As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report cover only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
Remark on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.





BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claims 1, 3-7, 11, 13-14, drawn to a purified mannosidase, polynucleotides and method of making.

Group II, claim 2, drawn to a binding agent that binds the purified protein.

Group III, claims 8-10 and 12, drawn to a method of altering glycosylation pattern of a macromolecule.

The inventions listed as Groups I-III do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Mannosidases, their polynucleotides, binding agents and method of altering the glycosylation pattern of macromolecules are well known in the prior art. Thus, the above invention, when considered as a whole does not contribute over the prior art (see Turco et al. J. Biol. Chem., 1982, Vol. 257(15):8674-8679).